
Photovoltaics for the 21st Century 9

Editors:

M. Tao

Arizona State University
Tempe, Arizona, USA

H. (Lili) Deligianni

IBM Watson Research Center
Yorktown Heights, New York, USA

M. E. Overberg

Sandia National Laboratory
Albuquerque, New Mexico, USA

K. Rajeshwar

University of Texas at Arlington
Arlington, Texas, USA

C. Claeys

IMEC
Leuven, Belgium

J. M. Fenton

University of Central Florida
Orlando, Florida, USA

J.-G. Park

Hanyang University
Seoul, South Korea

M. Sunkara

University of Louisville
Louisville, Kentucky, USA

Sponsoring Divisions:



Dielectric Science & Technology



Electrodeposition



Electronics and Photonics



Energy Technology



Industrial Electrochemistry and Electrochemical Engineering



Published by

The Electrochemical Society

65 South Main Street, Building D
Pennington, NJ 08534-2839, USA

tel 609 737 1902

fax 609 737 2743

www.electrochem.org

ecstransactions™

Vol. 58, No. 11

Copyright 2013 by The Electrochemical Society.
All rights reserved.

This book has been registered with Copyright Clearance Center.
For further information, please contact the Copyright Clearance Center,
Salem, Massachusetts.

Published by:

The Electrochemical Society
65 South Main Street
Pennington, New Jersey 08534-2839, USA

Telephone 609.737.1902
Fax 609.737.2743
e-mail: ecs@electrochem.org
Web: www.electrochem.org

ISSN 1938-6737 (online)
ISSN 1938-5862 (print)
ISSN 2151-2051 (cd-rom)

ISBN 978-1-62332-102-4 (Softcover)
ISBN 978-1-60768-456-5 (PDF)

Printed in the United States of America.

Table of Contents

Preface *iii*

Chapter 1 Organic and DSS Cells

Bulk-Heterojunction Solar Cells Based on Mixed Donors of P3HT and Phenylene–Thiophene Oligomer Derivative 3

T. Okukawa, S. Fujii, Z. Duan, Y. Ohori, Y. Kaneko, Y. Yanagi, A. Yoshida, M. Ohzeki, T. Yanagidate, Y. Arai, G. Zhao, H. Kataura, Y. Nishioka

Construction of Hierarchically Structured TiO₂ Nanotube Arrays for Efficient Dye-Sensitized Solar Cells 11

M. Ye, D. Zheng, M. Lv, C. Chen, Z. Lin, C. Lin

Nano-Ordering of Donor-Acceptor Interactions Using Metal-Organic Frameworks as Scaffolds 21

K. Leong, M. E. Foster, B. M. Wong, E. D. Spörke, D. Gough, J. C. Deaton, M. D. Allendorf

Optimizing Light Harvesting and Charge Collection in Dye-Sensitized Solar Cells Based on ZnO 29

T. Pauporté

Flexible PTB7:PC70BM Bulk-Heterojunction Solar Cells with LiF Cathode Buffer Layer 39

T. Yanagidate, S. Fujii, M. Ohzeki, Y. Yanagi, Y. Arai, T. Okukawa, A. Yoshida, H. Kataura, Y. Nishioka

Highly Conductive PEDOT: PSS Electrode Treated with Polyethylene Glycol for ITO-Free Polymer Solar Cells 49

D. A. Mengistie, P. C. Wang, C. W. Chu

Chapter 2 Inorganic Cells

Physical Characterization of Thin Films of $\text{Cu}_x\text{Zn}_y\text{S}_z$ for Photovoltaic Applications <i>F. Di Benedetto, S. Cinotti, A. Guerri, A. De Luca, A. Lavacchi, G. Montegrossi, F. Carlà, R. Felici, M. Innocenti</i>	59
Rapid Thermal Processing in CdS/CdTe Thin Film Solar Cells by Intense Pulsed Light Sintering <i>R. Dharmadasa, O. K. Echendu, I. M. Dharmadasa, T. Druffel</i>	67

Chapter 3 Poster Session

Development of Amorphous Carbon-Based Variable Optical Gap Semiconductor Materials <i>K. Honda, K. Yoshinaga, A. Nakahara</i>	79
Semi Transparent Electrode of Au Nano Mesh on Flexible Substrates Fabricated by Transfer Printing Using Self-Organized Porous Polymer Mold <i>Y. Yanagi, H. Saito, S. Fujii, T. Okukawa, A. Yoshida, T. Yanagidate, M. Ohzeki, Y. Arai, Y. Otori, D. Kaneto, R. Nagata, H. Kataura, Y. Nishioka</i>	89
Electrodeposition and Characterization of Hematite Films Obtained from DMSO Solution <i>G. Riveros, D. L. Ramírez Sr., E. A. Dalchiele, R. Marotti, L. M. Peter, P. Grez, F. Martín, J. R. Ramos-Barrado</i>	97
Electrochemical Deposition of Compact and Nanostructured Doped ZnO Films <i>D. L. Ramírez Sr., K. N. Álvarez, G. Riveros, M. Tejos, M. G. Lobos</i>	117
High Efficient Inverted Polymer Solar Cells by Surface Treatment of Zinc Oxide <i>S. Woo, W. Kim, H. K. Lyu</i>	131
Author Index	137